Homestead Dam Feasibility Study
Scope of Study

Task 1. Existing Data Collection and Review

1 Collect and review available data and resource information on file with the DES, other state agencies, Town of Swanzey, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, other federal agencies and other applicable sources. To include, but not be limited to, the following existing data:

1.1.1 Final Engineering Report on the effects of dam removal-related changes in river levels, velocities on scour susceptibility and the stability of the Thompson Covered Bridge, with conceptual alternatives for scour protection.

1.1.2 Data from ground penetrating radar surveys of the river channel, the bridge footprint and upstream of the dam.

1.1.3 Existing HEC-RAS model prepared by DES with revisions by CLD, Inc.

1.1.4 DES file correspondence, including meeting minutes on this project.

1.2 Perform a detailed dam inspection and site investigation. The inspection should be conducted by a Professional Engineer in the State of New Hampshire. Identify dam repair needs and appropriate dam removal methods.

1.3 Prepare a technical summary memorandum discussing the environmental and structural issues, as well as any additional critical issues discovered, of the dam, river and bridge based on the information collected above.

Task 2. Field Survey and Base Mapping

2.1 Dam Structure Topography Survey – The consultant shall complete a field survey of the dam structure, the Thompson Covered Bridge, and any impacted utilities and/or structures identified in Task 1. This should include property lines, existing easements and wetlands delineation.

2.2 Bathymetric Survey – The consultant shall complete a bathymetric survey of the impoundment, including under the bridge and extending upstream and downstream of the dam as far as necessary to conduct the hydrologic analyses outlined below in Task 4.

2.3 Existing Conditions Plan – Depict the structures, topography and impoundment bathymetry in plan view and cross section.

2.4 Deed and Title Search – Research the properties connected to the dam, including abutting properties.

2.5 Historic Resource Assessment – Preparation of a NH Division of Historical Resources (NHDHR) Project Area Form. Refer to generalized guidelines on conducting historic resource reviews for dam removal projects. Level of information required is currently limited to the following sections: Archaeological Resources: Phase IA (Reconnaissance-level) and Historic/Architectural/Engineering Resources: Phase I.

Task 3. Sediment Management.

3.1 Review of existing information on sediment analysis, including:

3.1.1 Organic Analytical Results from sediment samples collected at project site by the U.S. Fish and Wildlife Service.

3.1.2 "Sediment Management Plan for Homestead Woolen Mills Dam Removal" by R.T. Wood, 1999 Masters Project, Antioch New England Graduate School.

3.2 Review results of borings in existing resource (see Task 1.1.1). Assess needs for additional borings and/or field data collection.

3.3 Analyze sediment transport capabilities and mobility in conjunction with Task 4 for the dam removal alternatives proposed in Task 6.

3.4 Assess sediment analysis results and sediment transport results. Discuss appropriate sediment management options.

Task 4. Hydrology and Hydraulics Analysis

4.1 Conduct a hydrologic study of the Ashuelot River, including the dam, bridge, extent of impoundment and surrounding wetlands. Incorporate generated data into alternatives analysis.

4.2 Conduct a hydraulic analysis to predict water surface and velocity profiles for both existing and post-removal conditions of the Homestead Dam. Incorporate generated data into alternatives analysis.

4.3 Perform a scour analysis on the Thompson Covered Bridge and any impacted utilities identified in Task 1 to evaluate the potential impact of dam removal.

4.4 Assess the potential impacts associated with dam removal to the residential wells in close proximity to the Ashuelot River in the impounded area under seasonal low flow and high groundwater withdrawal conditions.

4.5 Conduct a pre-dam removal riverine ice survey upstream and downstream of the dam in order to collect ice data. This data will assist the Army Corps Cold Regions Research and Engineering Laboratory in the determination of potential ice jam development in the event of dam removal.

Task 5. Other Issues of Importance

5.1 Fish passage. Assess whether the site – if the dam is removed – would be passable by the fisheries of interest: American shad, river herring, Atlantic salmon and American eel. In the event that the dam is not removed, discuss appropriate project design options with the goal of effective upstream and downstream fish passage.

5.2 Structural impacts to the Thompson Covered Bridge. Assess impact of dam removal on pier and foundation stability. Discuss appropriate project design options with bridge stability as a stated goal.

5.3 Species of concern. Assess impact of dam removal on rare, threatened and endangered species located both up and downstream of the project area, including but not limited to dwarf wedgemussels and silver maple floodplain forest communities.

5.4 Fire Water Supply. Analyze usage of impoundment by local fire departments for 1) a source of water for fire fighting in the area, and 2) flushing of pumper trucks. Analysis of dam removal's impacts on fire suppression capabilities should not be limited to the Village of West Swanzey system, but include upstream points that are utilized. Discuss and develop cost estimates for alternative fire water supply

methods or sources, if determined to be necessary with dam removal option.

5.5 Stream Gage. Assess the impact of dam removal on the U.S. Geological Survey stream gage immediately upstream of the dam. Include possible relocation options.

5.6 Recreational Usage. Assess the impact of dam removal on boating, angling, swimming and other recreational uses of the river and impoundment.

5.7 Other socio-economic and political issues may arise during the consultant's research and investigation on the Homestead Dam. The consultant shall describe how such issues would be addressed.

Task 6. Feasibility Report Preparation

6.1 Alternatives analysis for the removal of the dam structure and structural stabilization of the Thompson Covered Bridge, if necessary.

6.2 Alternatives analysis to address other issues described in Task 5, which are not part of Task 6.1.

6.3 Preliminary costs for recommended alternatives analyzed in Tasks 6.1 and 6.2. Preliminary costs should be provided for at least one dam removal alternative and one dam retention alternative with upstream fish passage, including the cost of dam repair. In addition to construction cost estimates, these estimates should include the costs for engineering services to take the project to bid. This estimate should include the cost to prepare preliminary and final plans and specifications, permit application processing, and meeting attendance.

Task 7 Outreach and Coordination Meetings

7.1 Coordinate with project partners including DES, Town of Swanzey, NHFGD, USFWS, NOAA Restoration Center, CRWC and American Rivers.

7.2 Coordinate, allow input from, and present findings to the Town of Swanzey and other interested parties. Preparation of visual aids for the public. Provide for a qualified historian to attend two public informational meetings to present the findings of Task 2.5.

Task 8 Final Engineering and Permitting

8.1 If the removal of the dam is deemed feasible and it is acceptable to the dam owner the consultant may be retained to provide final engineering plans and specifications suitable for bidding purposes and to obtain all necessary permits. The consultant shall describe projected time frames for completing final plans and specifications, and obtaining all necessary approvals.